



DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

[Docket No. NHTSA-2012-0165; Notice 2]

General Motors, LLC, Denial of Petition for
Decision of Inconsequential Noncompliance

AGENCY: National Highway Traffic Safety Administration (NHTSA),
Department of Transportation (DOT).

ACTION: Denial of Petition.

SUMMARY: General Motors, LLC (GM)¹ has determined that certain model year (MY) 2011 through 2013 Buick Regal and MY 2013 Chevrolet Malibu passenger cars may not fully comply with the turn signal lamp failure indicator requirement found in paragraph S5.5.6 of Federal Motor Vehicle Safety Standard (FMVSS) No 108, *Lamps, Reflective Devices, and Associated Equipment*. GM has filed an appropriate report dated October 3, 2012, pursuant to 49 CFR Part 573, *Defect and Noncompliance Responsibility and Reports*.

ADDRESSES: For further information on this decision contact Mr. Mike Cole, Office of Vehicle Safety Compliance, the National Highway Traffic Safety Administration (NHTSA), telephone (202) 366-2334, facsimile (202) 366-5930.

¹ General Motors, LLC is a manufacturer of motor vehicles and is registered under the laws of the state of Michigan.

SUPPLEMENTARY INFORMATION:

I. GM's petition: Pursuant to 49 U.S.C. 30118(d) and 30120(h) (see implementing rule at 49 CFR Part 556), GM submitted a petition for an exemption from the notification and remedy requirements of 49 U.S.C. Chapter 301 on the basis that this noncompliance is inconsequential to motor vehicle safety.

Notice of receipt of the petition was published, with a 30-day public comment period, on September 19, 2013, in the Federal Register (78 FR 43965). No comments were received. To view the petition and all supporting documents log onto the Federal Docket Management System (FDMS) website at:

<http://www.regulations.gov/>. Then follow the online search instructions to locate docket number "NHTSA-2012-0165."

I. Vehicles Involved: Affected are approximately 109,563 MY 2011 through 2013 Buick Regal and MY 2013 Chevrolet Malibu passenger cars manufactured from January 20, 2010 through September 18, 2012.

II. Noncompliance: GM explains that the subject vehicles are equipped with front turn signals, each of which incorporates two light sources. When both light sources of either front turn signal fail, turn signal lamp failure indication is provided as required by paragraph S5.5.6 of FMVSS No. 108. However, turn signal lamp failure indication is not provided if only one of

the light sources fails in either front turn signal assembly. If a single bulb fails to illuminate, the turn signal is still illuminated by the other bulb.

III. RULE TEXT: Paragraph S5.5.6 of FMVSS No. 108 specifically states:

S5.5.6 Each vehicle equipped with a turn signal operating unit shall also have an illuminated pilot indicator. Failure of one or more turn signal lamps to operate shall be indicated in accordance with SAE Standard J588e, Turn Signal Lamps, September 1970...

IV. SUMMARY OF GM'S ANALYSES: GM stated its belief that the lack of turn signal lamp failure indication is inconsequential to motor vehicle safety for the following reasons:

1. As delivered to the customer the turn signal lamps function properly and meet all requirements of FMVSS No. 108. This is not a situation where the photometric output of the turn signals fails to meet the requirements as delivered to the customer. In fact, the light output of the normally operating turn signals greatly exceeds the photometric requirements as produced.
2. Most drivers will never be affected by the reduction of photometric output, without outage indication as a result of a single front bulb failure, because the failure rate of the turn signal bulb is extremely low. The bulb life of these turn signals is three to four

times the life of the bulbs used in turn signals when the turn signal lamps failure indication requirement was incorporated into the standard. The bulbs used in the subject front turn signals have a tested life of 1,100 hours at 12.8 volts. Using this information in a Monte Carlo simulation analysis provides the following results:

Years	2.5	5.0	7.5	10.0
Miles	31,250	62,500	93,750	125,000
No. of Burnouts	0	0	1	4
SIM Vehicles	10,000	10,000	10,000	10,000
Failure IPTV	0.000	0.000	0.400	4.000

Consequently, it is extremely unlikely a driver will experience a single turn signal bulb failure over the life of the vehicle, and thus the lack of outage indication, with a single bulb failure, is inconsequential to motor vehicle safety.

3. With a single bulb, the turn signal still functions and provides perceptible indication that the vehicle may be turning. In the extremely remote case that both light sources were to fail, in either front turn signal, bulb outage is indicated as required by the standard.

4. In the Malibu vehicle, if an outboard front turn bulb is not working, the inboard bulb continues to meet the photometric requirements. In this case, the centroid of the light shifts and is greater than 100 mm from the lit edge of the low beam head lamp. The light output of the inboard bulb easily meets the minimum photometric requirements specified in FMVSS No. 108.
5. If the inboard bulb burns out on the Malibu, or either bulb on the Regal, the remaining lamp continues to provide light which meets the photometric requirements in some zones, and comes close to the requirements in most of the remaining zones. This light exceeds the standard turn signal photometric requirements, but due to the location of the turn signal (i.e., the turn signal centroid within 100 mm of the lit edge of the low beam lamp) the 2.5 multiplier must be applied to photometric requirements.
 - a. For the Malibu turn signal lamps, the photometric requirements with the 2.5 multiplier, are met in three of the five zones; and are within 25% of the requirements in a 4th zone.
 - b. For the Regal turn signal lamps, the photometric requirements with the 2.5 multiplier, are met in two

of the five zones; and are within 25% of the requirements in two other zones.

The Malibu and Regal turn signal lamps provide the required light under normal driving conditions. In the unlikely circumstance that a single bulb stops functioning, the remaining bulb continues to provide the minimum turn signal light specified in the standard and is generally within 25% of the minimum required light after the 2.5 multiplier is applied. In the case of these vehicles, GM's analysis indicates the light provided by the single bulb is perceptible to the motoring public.

GM has additionally informed NHTSA that it has corrected the noncompliance so that all future production vehicles will comply with FMVSS No. 108.

In summation, GM believes that the described noncompliance of its vehicles is inconsequential to motor vehicle safety, and that its petition, to exempt from providing recall notification of noncompliance as required by 49 U.S.C. 30118 and remedying the recall noncompliance as required by 49 U.S.C. 30120 should be granted.

V. NHTSA's Analysis OF GM's Petition: General Principles:

Federal motor vehicle safety standards are adopted only after the agency has determined, following notice and comment, that

the performance requirements are objective and practicable and ``meet the need for motor vehicle safety.'' See 49 U.S.C. 30111(a). Thus, there is a general presumption that the failure of a motor vehicle or item of motor vehicle equipment to comply with a FMVSS increases the risk to motor vehicle safety beyond the level deemed appropriate by NHTSA through the rulemaking process. To protect the public from such risks, manufacturers whose products fail to comply with a FMVSS are normally required to conduct a safety recall under which they must notify owners, purchasers, and dealers of the noncompliance and provide a remedy without charge. 49 U.S.C. 30118-30120. However, Congress has recognized that, under some limited circumstances, a noncompliance could be ``inconsequential'' to motor vehicle safety. ``Inconsequential'' is not defined either in the statute or in NHTSA's regulations. Rather, the agency determines whether a particular noncompliance is inconsequential to motor vehicle safety based on the specific facts before it. The key issue in determining inconsequentiality is whether the noncompliance in question is likely to increase the safety risk to individuals of accidents or to individual occupants who experience the type of injurious event against which the standard was designed to protect. See General Motors Corp.; Ruling on Petition for Determination of Inconsequential Noncompliance, 69 FR 19897 (Apr. 14, 2004).

There have been instances in the past in which NHTSA has determined that a manufacturer has met its burden of persuasion by demonstrating that a noncompliance is inconsequential to safety. For example, there have been instances where NHTSA granted inconsequentiality petitions regarding noncompliance with labeling requirements. See, e.g., General Motors Corp., Grant of Application for Decision of Inconsequential Noncompliance, 61 FR 60746 (Nov. 29, 1996) (noncompliance with FMVSS No. 115).

More rarely, NHTSA has granted inconsequentiality petitions in cases of noncompliance with performance requirements where the noncompliance was determined to be so minor as to be inconsequential—for example, where the noncompliance is expected to be imperceptible, or nearly so, to vehicle occupants or approaching drivers. See, e.g., General Motors Corp., Grant of Application for Decision of Inconsequential Noncompliance, 63 FR 70179 (Dec. 18, 1998) (noncompliance with FMVSS No. 108); Subaru of America, Inc., Grant of Application for Decision of Inconsequential Noncompliance, 66 FR 18354 (Apr. 6, 2001) (noncompliance with FMVSS No. 108).

On the other hand, NHTSA has denied petitions for inconsequential noncompliance where required equipment is completely missing from the vehicle. For example, NHTSA denied a petition for travel trailers not equipped with rear

identification lamps. Weekend Warrior Trailers, Inc., Denial of Petition for Decision of Inconsequential Noncompliance, 71 FR 5409 (Feb. 1, 2006).

In addition, NHTSA has denied inconsequentiality petitions for trailers that were equipped with clearance and identification lamps that did not meet the minimum photometry requirements. Utilimaster Corporation; Denial of Application for Decision of Inconsequential Noncompliance, 66 FR 33603 (June 22, 2001).

VI. NHTSA's Analysis of GM's Arguments: NHTSA has reviewed GM's petition and has determined that the noncompliance is not inconsequential to motor vehicle safety.

First, GM asserts that the turn signals as delivered, comply with the photometric requirements. However, the agency finds that this should be true of all newly manufactured motor vehicles and finds that fact to be unrelated to the requirements that apply in the event of a turn signal failure.

Second, GM states that the tested life of these turn signal bulbs is 1100 hours; three to four times the life of the bulbs used in turn signals when the bulb outage indication requirement was incorporated into the standard. As such, GM believes that it is extremely unlikely a driver will experience a single turn signal bulb failure over the life of the vehicle.

NHTSA notes that the requirements for driver indication of a turn signal failure became effective over 40 years ago and since that time improvements have been made to the life of turn signal bulbs and motor vehicles. For light sources, this includes the development of long life bulbs and the introduction of light emitting diodes (LEDs) into motor vehicle applications. For vehicles, the Federal Highway Administration posted a chart of the "Average Age of Automobiles and Trucks in Use, 1970-1999" that indicates the average vehicle age in 1970 was 5.6 years. (this information was compiled from Polk Company data by Ward's Communications, Ward's Motor Vehicle Facts and Figures from 2001) By 2013, Polk posted that the average vehicle age that year was 11.4 years. (see https://www.polk.com/company/news/polk_finds_average_age_of_light_vehicles_continues_to_rise) At the time that the bulb outage indication requirement became part of the FMVSS 108, SAE J573d DEC68 listed the average turn signal bulb laboratory life as approximately 500 hours. Comparing that to the GM specified bulb life of 1100 hours yields a similar doubling of bulb life compared to the increase in the average vehicle age. Therefore, while the bulb life has indeed increased, it has increased at a rate similar to the average vehicle age which mathematically makes a bulb failure, when compared to vehicle life, the same likelihood now as it was in 1970.

Additionally, GM did not make any mention of the actual voltage that the electrical systems of the vehicles in question would be providing to the front turn signal bulbs. Factors such as voltage, heat, vibration and corrosion are all important things to consider that can have a significant effect on the life of a bulb and no consideration was given to these factors in GM's petition. For instance, GM technical bulletin 04-08-42-002 indicated that for certain vehicles, (2003-2004 Saturn ION) the "amount of voltage supplied to the front headlamp assembly for the turn signal circuit may cause the bulb to prematurely wear out."

Other turn signal lamp failure modes exist as well. For example, GM recall 06V-263 (2004-2005 Cadillac XLR) described premature bulb failure due to "vibration within a loose fitting socket or air entering the bulb due to an inadequate seal." Also, GM recalls 04V-547 (2003-2004 Saturn ION) and 04V-524 (2003 Chevrolet Cavalier and Pontiac Sunfire), described turn signal lamp failure due to "loss of" and "inadequate" "contact between the bulb and socket."

As such, NHTSA believes that there are many light source related failure modes that can cause a turn signal lamp to fail, and GM's argument that a light source failure is extremely unlikely based on laboratory bulb life does not adequately consider these other failure modes.

Third, Fourth, and Fifth, GM offers several scenarios regarding the photometric performance of the turn signal lamp in the event that a single light source were to fail. Each one of GM's scenarios relies on downgrading the performance of the original equipment turn signal lamp from a large, two lighted section lamp, down to a smaller, one lighted section lamp. This results in a photometric performance requirement reduction of ~15% in the zones, as well as similar reductions at the individual test points. Even under the requirements assumed by GM for its scenarios, 75% of GM's scenarios still fail to meet even the reduced requirements.

GM argues that despite the failure of the lamps in these scenarios to meet the photometric requirements at some of the zones, it was within 25% of the minimum zonal requirements. When referring to these zonal failures, and within "25%" of the zonal requirements, it appears that GM is making a just noticeable difference (JND) argument relative to the zones. A NHTSA study titled ``Driver Perception of Just Noticeable Differences of Automotive Signal Lamp Intensities'' [DOT HS 808 209, September 1994] demonstrated that a change in luminous intensity of 25 percent or less is not noticeable by most drivers. However, NHTSA has stated that it is not valid to use the JND justification for judging the effect of zonal intensity

failures. Drivers do not look at zones when they observe lamps; they look at the lamp from very narrow angles based on the distance between their eyes and the distance to the lamp. Using the JND justification on zones would imply that drivers would be looking at lamps from all the test points in the zone simultaneously and somehow integrating the numerous intensities into some false representation of how intense the lamp should be. This is simply not the case. For this reason, the JND argument is not applicable to zone failures. (see 62FR63417)

VII. Prior Inconsequentiality Petitions: NHTSA found one prior inconsequentiality determination regarding the turn signal bulb outage requirements of FMVSS No. 108. In 1999, General Motors determined that it had manufactured 209 Chevrolet S10 Electric Trucks that were non-compliant with the requirement. The agency granted GM's petition on the basis that these low volume trucks were mainly used in fleets and that they would receive regular periodic maintenance where detection of the failure of a turn signal lamp and replacement thereof would be more likely than in privately owned vehicles. As such, NHTSA felt that the likelihood of these low volume trucks having any sustained period of outage would be a relatively infrequent event. (see 64 FR 44575) In contrast, the current situation involves 109,563 Chevrolet Malibu and Buick Regal passenger cars which are likely to be privately owned vehicles. Considering that a

partial failure may go unnoticed by the vehicle owner, NHTSA believes that the likelihood of a sustained period of reduced turn signal performance due to an outage would be high.

VIII. DECISION: In consideration of the foregoing, NHTSA has decided that GM has not met its burden of persuasion that the FMVSS No. 108 noncompliance described is inconsequential to motor vehicle safety. Accordingly, GM's petition is hereby denied, and GM is obligated to provide notification of, and a remedy for, that noncompliance under 49 U.S.C. 30118 and 30120.

Authority: (49 U.S.C. 30118, 30120: delegations of authority at 49 CFR 1.95 and 501.8)

Issued on: July 9, 2014.

Nancy Lummen Lewis,
Associate Administrator
for Enforcement.

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